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AUTHOR Bein, Frederick L.
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ABSTRACT

A geography skills test was administered to over 3,000 Indiana college students enrolled in introductory geography courses in 1987. The National Council for Geographic Education Competency-Based Geography Test, Secondary Level, Form D, was used to measure geographic ability in the area of map skills, place name location, physical geography, and human geography. Geographic skills were correlated with respondent age, sex, ethnicity, past travel experience, and past geographic education. Students with previous travel experience were expected to score better on the test while geographically bound groups were expected to score lower. A strong correlation exists between travel and geographic skill. Geographic abilities differ according to age, sex, and ethnicity, but these differences can be attributed to varying degrees of access to travel. (Fourteen tables of data are included.) (Author)

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IMPACT OF TRAVEL ON GEOGRAPHIC COMPETENCY

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Frederick L. Bein, Ph.D.
Department of Geography
Indiana University at Indianapolis
425 Agnes Street
Indianapolis, Indiana 46202
317-274-8877

Paper presented at the Annual Meeting of the National Council for Geographic Education, Snowbird, Utah, 8 October 1988.

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ABSTRACT

IMPACT OF TRAVEL ON GEOGRAPHIC COMPETENCY administered in Indiana universities by Frederick L. Bein, Department of Geography, Indiana University, Indianapolis, Indiana 46202.

A geography skills test was administered to over 3,000 Indiana college students enrolled in introductory geography courses in 1987. The National Council for Geographic Education Competency-Based Geography Test, Secondary Level, Form D, was used to measure geographic ability in the area of map skills, place name location, physical geography, and human geography. Geographic skills were correlated with respondent age, sex, ethnicity, past travel experience, and past geographic education. Students with previous travel experience were expected to score better on the NCGE test while geographically bound groups were expected to score lower. A strong correlation exists between travel and geographic skill. Geographic abilities differ according to age, sex, and ethnicity, but these differences can be attributed to varying access to travel.

IMPACT OF TRAVEL ON GEOGRAPHIC COMPETENCY

A test of geographic ability was administered during the 1987 Fall Term at 18 Indiana institutions[1] of higher education. Over 3,000 students enrolled in freshman geography courses were examined with respect to knowledge of map skills, place-name geography, physical geography and human geography. The Competency-based Geography Test, Secondary Level Form II, by the National Council for Geographic Education (NCGE) was employed and administered by the Geography Educators Network of Indiana (GENI). The test was financed by the National Geographic Society, George F. Cram Corporation the Indiana University at Indianapolis Computing Center and the National Council for Geographic Education.

Geographic knowledge and skill is a major deficiency among U.S. residents, a serious problem given the intricate global networks which exist and the world leadership role of the U.S. This lack of geographic ability also does not serve the localized Indiana need for its citizens to be more globally sensitive. The conversion of Indiana's traditional industrial-based economy to a modern highly automated economy will depend on its ability to more effectively enter and develop foreign market relationships. The future of Indiana and its economy will depend in part upon its ability to develop a better international perspective to enable more effective participation in the world economy.(1)

In the last ten years numerous studies have documented the general lack of geographic abilities among American students. These include (to name a few) a state wide study in Kentucky administered in several geography departments at State institutions (2), studies by Cross (3) and Helgren (5). A similar study in Indiana in 1985 documented the lack of place-name geography among Indiana college freshmen.(1) The recent Gallup Poll demonstrates a serious national deficiency in Geographic knowledge. (4)

These previous studies predominantly examine place-name geographic knowledge, which in itself is worthwhile but does not reveal the extent of knowledge of conceptual geography. Because of this limitation it was decided to

administer a test in Indiana which also measured spatial thinking abilities. The NCGE Competency-based geography test, Secondary Level Form II, was adopted for this study.

It was decided to group the seventy-five questions of the NCGE test into four categories which could be generally associated with different geographic skills. Questions 1-8 were designated as map skills and 9-20 as map place-name identification. Questions 21-40, Part II of the format, were already designated as physical geography and adequately served the purpose of the test. Part III or "Human Geography" made up questions 41-75 which were also kept as a separate group. By computerizing the results it would be possible to determine differences in abilities over the four areas.

Personal information questions were designed by the Geography Educators Network of Indiana to accompany the NCGE test. This data was designed to be collected on the same computer answer form used for the competency test. This information was used to determine if certain segments of the population were receiving inadequate education. Ultimately this would be used to make recommendations to the State of Indiana. Questions asked concerned: study concentration, state of residence, class status, number of states and countries lived in, number of times traveled to states and countries outside your home state, sex, age, ethnic group, reason for taking the course, previous geography courses in high school or in college.

RESULTS

Preliminary results show that the 3,382 Indiana students scored best on the place-name map identification with 75% correct. With decreasing ability, they scored 70% on map skills, 63% on human geography and 58% on physical geography. Specific results follow, showing extremes on each of the four sections.

STATISTICAL ANALYSIS

The next step in the analysis involved the correlation of the student test performances with the personal information. Composite percentage scores were derived for the four areas of the test: map skills, map identification, physical geography and human geography. These scores were compared for the different demographic groups to see if certain segments of our population were not receiving as much geographic education as others. In no way would these results be interpreted as measures of geographic aptitude. Student T, Tukey, and Scheffe statistical tests were used to determine significant differences at the 95% level of confidence for different student groups. Highlights of the analysis of variance reveal some variations among the sampled population.

It was found that Arts and Science students score significantly higher than other students. Perhaps this is because of interest and background of the students, but also because general interest orientation of Arts and Science curriculums would include more geography. Students majoring in education scored lower than all other groups.

The tests of class status show no significance statistically between Freshmen, Sophomores, Juniors, and Seniors, although there was a tendency for the more advanced students to score slightly higher (Table II).

Experience outside of the student's home state was thought to have had an influence on geography skills. Various types of travel data were gathered to measure this. Students were asked:

a) In how many states or countries have you <u>lived</u> before reaching the age of 17?

b) In how many states or countries have you <u>lived</u> after reaching the age of 17?

c) How many <u>times</u> have you traveled outside of your home state?

d) In how <u>many</u> states and countries have you traveled?

It was thought that people who had experienced living in a variety of different states and countries would have greater geography abilities. This did not prove true for those who had lived in a greater number of places before reaching the age of 17 (Table III). The mature living experience, however, seems to improve peoples geographic thinking skills. A slight statistical support shows some relationship between geographic ability and the number of states in which one has resided after reaching the age of seventeen.

Frequent travelers score higher on the geography skills test than those who have not traveled (Table IV). A direct relationship appears to exist between times traveled and test scores. A causal relationship is not necessarily true however, as it might also be said that "those who know their geography endeavor to travel more."

A stronger correlation exists with the number of places one has traveled (Table V). It appears that Geographic ability on the test improves more with an increase in the number of places visited than it does with the number of times traveled. Repeat visits to the same place would not seem to contribute as much to general geographic knowledge as do visits to different places.

Closer examination of the responses to the test questions sheds further light on the geographic abilities of the well traveled. The well traveled individuals score significantly higher (95% levels of confidence) on test questions which involve maps. On the other hand, certain types of questions on the NCGE test do not present a significant advantage to the well traveled student. Questions relevant to a climograph or a topographic profile are equally difficult to the well travelled. Obviously, such visuals do not enhance the act of traveling as would a map.

Students who had previous geography courses would be expected to score better on the test (Table VI). This did not prove to be statistically different for those students who had high school geography. But, for students with at least one university geography course, scores were significantly higher than those who had none. There was no significant correlation in the test scores and additional university courses beyond the initial geography course.

Differences between males and females are significantly pronounced on the test results. Males score higher than females (Table VII). This should not be interpreted as a difference in aptitude but as a difference in exposure to geography. I think many cultural factors encourage males to acquire more geography. As noted above "travel," apparently a strong contributor to geographic skills, may be more accessible to men than to women. When comparing the sampled males and females by frequency of travel outside the home state and also by numbers of places visited outside of the home state, significant chi square statistics shows that men travel more than women. This further strengthens the position that there is a relationship between travel and geographic knowledge. (Tables VIII and IX).

The factor of age was examined to see if differences occurred; afterall, it was previously shown that more advanced students scored higher than more junior students. When comparisons by age were made, a similar conclusion shows older people scoring significantly higher (Table X). To say maturity contributes to geographic ability might also be obscuring the affect travel has in contributing to geographic knowledge, as it may be the factor of travel which provides age its geographical ability.

When isolating the 18-24 year old population and comparing travel experience with test scores, this finding is confirmed as the correlation with travel becomes more pronounced.

Part of the inquiry was to determine if certain ethnic parts of our society were receiving different exposures to geographic education. The information of ethnicity was obtained to get at this question (Table XI). Results showed that Blacks scored significantly lower than Hispanics, Asians and Caucasians. This low performance of the Black students on the NCGE test might be attributed to the Black community's lack of access to travel.

CONCLUSION

One general conclusion is made in this paper: Those who travel score better on the NCGE Competency Based Geography Test. Based on this test, Geography is shown to be an experiential discipline and the greatest geography competency advantage is attributed to the greatest number of places one has visited. Women and Blacks score lower in geography ability because of less access to travel. Additional study needs to isolate factors of age, sex and ethnicity to further evaluate the impact on geographic competency.

Table I: The highest and lowest average item scores of 3,382 Indiana college students on the NCGE Secondary Competency-based Geography Test, 1987.

Map Skills
43% have misconception that a river cannot flow north.
48% understand latitude and longitude.
87% are able to tell directions and distances on a map.

Place-name Identification
51% know the Sahara Desert is located in North Africa.
54% know the conceptual difference between Central and Latin America.
61% can identify Egypt on a map.
66% can locate Israel on a map.
72% can identify Japan on a map.
94% can identify Australia and the Soviet Union on a map.

Physical Geography
63% understand that soil erosion occurs on steep slopes.
35% know that the Soviet Union has abundant natural resources while 53% think that they are severely limited.
92% know that Mexico has a warmer climate than Canada, USSR and U.K.

Human Geography
74% know that the same language is spoken in the United Kingdom that is spoken in the U.S.
There is little awareness of dominant religions around the world:
39% know that Islam is the dominant religion in Middle East.
66% know that Buddhism is concentrated in Asia.

TABLE II

What is your class status?

Class	N	Mean Score (75)
Freshman	1,026	48
Sophomore	1,091	48
Junior	682	49
Senior	443	51
Graduate	7	55
Total	3,249	47

Probability of error 0.0001

F value = 9.16

Mean correct responses out of 75 on NCGE Competency-based Geography Test. Secondary Level Form II, results of 3,000+ students enrolled in introductory Geography courses at 18 Indiana Universities.

TABLE III

In how many states or countries have you lived?

Places Lived	N	Before Age 17 Mean Score (75)	N	After Age 17 Mean Score (75)
one	2,284	48.0	2,552	48
2-3	747	50.0	535	51
4-6	159	48.0	105	52
7-10	35	48.0	27	53
11+	17	48.0	14	53
Total	3,243	48.6	3,233	48.7
Probability of error		0.0376		0.0001
F Value		2.6		9.9

Mean correct responses out of 75 on NCGE Competency-based Geography Test. Secondary Level Form II, results of 3,000+ students enrolled in introductory Geography courses at 18 Indiana Universities.

TABLE IV

Travel History: How many times have you traveled outside of your home state?

Times Traveled	N	Mean Score (75)
Never	8	38
1-3	99	42
4-7	387	46
8-12	493	47
13+	2,251	50
Total	3,238	49

Probability of error 0.0001

F Value = 23

Mean correct responses out of 75 on NCGE Competency-based Geography Test. Secondary Level Form II, results of 3,000+ students enrolled in introductory Geography courses at 18 Indiana Universities.

TABLE V

In how many states and countries outside of your home state have you traveled?

Number of Places Traveled	N	Mean Score (75)
None	72	44
1-3	254	45
4-7	614	46
8-12	768	47
13+	1,529	51
Total	3,237	48.6

Probability of error 0.0001

F value = 48

Mean correct responses out of 75 on NCGE Competency-based Geography Test. Secondary Level Form II, results of 3,000+ students enrolled in introductory Geography courses at 18 Indiana Universities.

TABLE VI

How many previous geography courses have you had in high school?

Number of Courses in High School	N	Mean Score (75)
None	1,842	48
One	1,032	49
Two	232	49
Three	35	48
Four +	18	52
Total	3,059	48.6

Probability of error 0.8130

F value = .39

Mean correct responses out of 75 on NCGE Competency-based Geography Test. Secondary Level Form II, results of 3,000+ students enrolled in introductory Geography courses at 18 Indiana Universities.

TABLE VII

What is your sex?

Sex	N	Mean Score (75)
Male	1,526	51
Female	1,700	47
Total	3,226	48.6

Probability of error 0.0001

F value = 138.49

Mean correct responses out of 75 on NCGE Competency-based Geography Test. Secondary Level Form II, results of 3,000+ students enrolled in introductory Geography courses at 18 Indiana Universities.

TABLE XIII

How many previous Geography Courses have you had in College?

No. of Courses in College	N	Mean Score (75)
None	2,646	48
One	364	50
Two	73	55
Three	12	54
Four +	22	57
Total	3,117	48.6

Probability of error 0.0001

V value = 11.75

Mean correct responses out of 75 on NCGE Competency-based Geography Test. Secondary Level Form II, results of 3,000+ students enrolled in introductory Geography courses at 18 Indiana Universities.

TABLE X

What is your age?

Age	N	Mean Score (75)
Less than 17	57	49
18-24	2,723	48
25-34	297	51
35-44	134	54
45+	32	54
Total	3,243	48.6

Probability of error 0.0001

F value = 15.01

Mean correct responses out of 75 on NCGE Competency-based Geography Test. Secondary Level Form II, results of 3,000+ students enrolled in introductory Geography courses at 18 Indiana Universities.

TABLE XI

Ethnic group?	N	Mean Score (75)
Black	103	38
Hispanic	50	46
Asian	51	46
White	2,936	49
Other	23	46

Probability of error .0001

F Value 26.21

Mean correct responses out of 75 on NCGE Competency-based Geography Test. Secondary Level Form II, results of 3,000+ students enrolled in introductory Geography courses at 18 Indiana Universities.

TABLE XII

Were your high school Geography courses interesting or boring?

Ranking	N	Mean Score (75)
Interesting	174	50
Somewhat Interesting	279	51
Neutral	646	48
Somewhat Boring	314	47
Boring	298	45
Total	1,711	47.87

Probability of error 0.0001

F value = 11.59

Mean correct responses out of 75 on NCGE Competency-based Geography Test. Secondary Level Form II, results of 3,000+ students enrolled in introductory Geography courses at 18 Indiana Universities.

TABLE XIV

Were your college Geography courses interesting or boring?

Ranking	N	Mean Score (75)
Interesting	118	52
Somewhat interesting		175
52		
Neutral	260	48
Somehwat boring	108	45
Boring	203	44
Total	864	48.0

Probability of error 0.0001

F value = 14.8

Mean correct responses out of 75 on NCGE Competency-based Geography Test. Secondary Level Form II, results of 3,000+ students enrolled in introductory Geography courses at 18 Indiana Universities.

NOTES

[1]Participating institutions included: Ball State University, Butler University, DePauw University, Indiana State University, Indiana University (Bloomington, Fort Wayne, Gary, Indianapolis, Columbus, and New Albany Campuses), Notre Dame, Purdue University, Purdue North Central, Taylor University, Tri-State University, University of Indianapolis, Valparaiso University and Vincennes University.

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